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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/581,333	05/31/2006	Alexander Bovyrin	42390P21485	6241
8791 7590 07/21/2009 BLAKELY SOKOLOFF TAYLOR & ZAFMAN LLP 1279 OAKMEAD PARKWAY SUNNYVALE, CA 94085-4040				
EXAMINER				
BITAR, NANCY				
ART UNIT		PAPER NUMBER		
2624				
MAIL DATE		DELIVERY MODE		
07/21/2009		PAPER		

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/581,333

Applicant(s)

BOVYRIN ET AL

Examiner

NANCY BITAR

Art Unit

2624

Period for Reply -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 27 March 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1, 4, 6, 7, 10, 12, 13 and 17-23 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1, 4, 6, 7, 10, 12, 13 and 17-23 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 31 May 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Response to Arguments

1. Applicant's response to the last Office Action, filed 12/23/2008, has been entered and made of record.
2. Applicant has amended claims 1,7 and 13. Claims 2,3,5,8, 9,11 and 14-16 have been cancelled. Claims 18-23 have been added Claims 1,4,6,7,10,12,13, and 17-23 are currently pending.
3. Applicants arguments filed 3/27/2009 have been fully considered but are moot in view of the new ground(s) of rejection necessitated by the amendments. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of Sawhney et al (US 2001/0043738).

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1,4,6,7,10,12,13, and 17-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Melo et al (Viewpoint Independent Detection of Vehicle Trajectories and Lane Geometry) in view of Reno et al (Learning Surveillance Tracking Models for the Self Calibrated Ground Plane) further in view of Sawhney et al (US 2001/0043738).

As to claims 1, Melo teaches a method of analyzing video frames capturing a 3D scene over time to automatically generate a road map of the 3D scene (produces accurate trajectories and estimates lane geometry; see abstract)comprising: detecting positions of objects in the video frames(lane geometry can be estimated from uncalibrated but stable video sequences; section 1); estimating 3D transformation parameters for the objects (estimate the lane geometry using uncalibrated traffic surveillance cameras, see abstract) ; predicting heights of the objects based at least in part on the 3D transformation parameters (vehicle length, section 1) removing outliers from the predicted heights of objects to produce a filtered set of objects; using the filters set of objects to repeat estimating the 3D transformation parameters and to repeat predicting the height of the objects (section 4) .While Melo meets a number of the limitations of the claimed invention, as pointed out more fully above, Melo fails to specifically teach Estimating road boundaries of the 3D scene using a background image and the positions of the objects; Generating the road map; Removing outlier pixels from the road map and estimating a height map for objects moving on a road of the road map. Specifically, Reno et al. et al. teaches rather than relying on labour-intensive calibration procedures to recover the image to ground-plane homography, the system relies on a simple auto-calibration procedure to learn the relationship between image and world by simply watching events within the monitored scene. Moreover, Reno et al. teaches

estimating 3D transformation parameters for the object (section 2-2.1; figure 1) and predicting the height of the object (section 2.2). Note that the height model is derived from the optical geometry of a typical visual surveillance installation. In addition, such an assumption enables the use of simple but highly discriminatory models of the appearance of scene objects which indirectly use the depth of the object to model its projected height. It would have been obvious to one of ordinary skill in the art to use the auto calibration in Melo method in order to simplify auto-calibration procedure to learn the relationship between image and world by simply watching events within the monitored scene. Neither Melo nor Reno teaches the generating a height map moving on the road of the road map. Specifically, Sawhney et al teaches estimating and representing a refined surface shape as a height map associated with the selected planar surface. Given the previously determined camera poses, these height maps may be estimated by dense 3D estimation techniques from two or more observed images. The outcome of this process is a hybrid shape representation that augments the polyhedral model with local shape variation (paragraph [0075-0079] and figure 11) . It would have been obvious to one of ordinary skill in the art to estimate a height map for objects moving on a road of the road map in the height model of Reno in order to accurately obtain pose information. Therefore, the claimed invention would have been obvious to one of ordinary skill in the art at the time of the invention by applicant.

As to claim 4, Melo teaches the method of claim 1, wherein detecting positions of objects comprises applying a foreground object detection process to the video frames (A detected foreground blob comprises a connected region having more than a certain pre-defined minimum number of pixels (K_{min}) in its area. A constant acceleration Kalman Filter (KF) is used to track the blobs through image coordinate space, see section 3)

As to claims 6 and 12, Melo teaches the method of claim 7, wherein estimating road boundaries comprises applying a region growing process to object positions to find pixels of the video frames belonging to a road surface in the 3D scene; and removing outlier pixels from the road map (RANSAC is robust to outlier trajectories produced by frequent vehicle lane changes, undetected overlapped vehicles and noise in the video sequence. section 4; page 459)

The limitation of claims 7,10 has been addressed above.

Claim 13 and 17 differ from claim 1-6 only in that claim 1-6 are method claims whereas, claim 13-17 are system claims. Thus, claims 13 and 17 are analyzed as previously discussed with respect to claims 1-6 above.

As to claims 18 and 20 and 22, Sawhney et al teaches the method of claim 1, wherein the objects comprise a representation of a human being in the video frames (figure 12, 1204) .

As to claims 19 and 21 and 23 , Sawhney et al teaches the method of claim 1, wherein the estimating the road boundaries of the 3D scene comprises filling a uniform color region starting from a foot of a position of an object of the objects and stopping when an edge pixel of the background image is reached (paragraph [0076-0080]).

Conclusion

6. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to NANCY BITAR whose telephone number is (571)270-1041. The examiner can normally be reached on Mon-Fri (7:30a.m. to 5:00pm).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vikram Bali can be reached on 571-272-7415. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Nancy Bitar/
Examiner, Art Unit 2624

/VIKKRAM BALI/
Supervisory Patent Examiner, Art Unit 2624